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| 10/064,980 | 09/05/2002 | Brian S. Hilton | 112213 | 9026 |

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EXAMINER

GORDON, BRIAN R

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
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1743

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/064,980

Applicant(s)

HILTON, BRIAN S.

Examiner

Brian R. Gordon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6-5-02.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9-5-02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 250. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 5-8, 10-13, 17, and 19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Hawkins et al. US 6,273,552.

Hawkins et al. disclose an image forming system and method for forming an image on a recording medium, the system including a thermo-mechanically activated

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DOD (Drop On Demand) printhead including a DOD print head having a plurality of ink channel pistons, and method of assembling the system and print head.

The device is controlled by controller 110. The printhead 150 comprises an array of micromachined ink channel pistons 250 positioned above nozzles 190, each nozzle 190 capable of ejecting ink droplet 200. Each nozzle 190 is etched in an orifice plate or substrate 195, which may be silicon, and defines a channel shaped chamber 210 in nozzle 190. Chamber 210 is in communication with reservoir 130, such as by means of previously mentioned conduit 140, for receiving ink from reservoir 130. In this manner, ink flows through conduit 140 and into chamber 210 such that an ink body 220 is formed in chamber 210. In addition, nozzle 190 defines a nozzle orifice 230 communicating with chamber 210. Pistons 250 are actuated by the vertical movement of a motive source 251 via the movement of a plate 252 and membrane 253 (plurality of actuators associated with one of the ejection structures) covering the top of printhead 150. It may be appreciated that the ink covers a shaft portion of piston 250, but not does not touch the inside portion of plate 252 and membrane 253. Downward movement can be provided by an elastic seal 254 interconnecting plate 252 and body of print head 150.

The plate, membrane, and elastic seal are all flexible, thus the elements may be considered a plurality of flexible diaphragms as specified in claim 7.

Referring to FIG. 9, there is shown a second embodiment printhead 150. This second embodiment printhead is substantially similar to the first embodiment printhead, except that motive source 251 is formed of a metallic material that is responsive to an electromagnetic field 400. Electromagnetic field 400 is generated by each of a first

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electromagnet 410a and a second electromagnet 410b spaced-apart from first electromagnet 410a (as shown) (claim 10).

As to the method claims, the multiple pistons are operated sequentially to produce a continuous flow of liquid from the dispense head.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 2-4, 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. as applied to claims 1, 5-8, 10-13, 17, and 19-20 above, and further in view of Sheridan et al. US 2003/0027342.

Hawkins et al. do not disclose the device as comprising medical fluid.

Sheridan et al. discloses a method and an apparatus for facilitating the creation and study of biological substrates.

Shereidan further teaches inkjet heads are capable of precisely positioning biological materials is found in connection with microarrays. Microarrays are sets of densely spaced, miniaturized chemical or biochemical reaction sites (or spots) on a microscope slide or other solid supports. Examples of microarrays include: DNA, protein, cell tissue, antibody, vaccine, and antiviral arrays. The reaction sites are typically arranged in an array or a grid pattern. The sites may be deposited on the substrate by contact printing using pins or capillaries, or non-contact printing using an inkjet, piezoelectric or magnetostrictive actuated microdispenser, micro-electro-mechanical systems (MEMS) microfluidics dispenser, or syringe solenoid liquid handling device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to recognize the system of Hawkins et al. may be employed to dispense medical fluids to form precisely positions spots on solid supports to form arrays for biological testing.

7. Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins et al. as applied to claims 1, 5-8, 10-13, 17, and 19-20 above, and further in view of DeBar et al. US 6,830,701.

Hawkins does not disclose the device as comprising an electrostatic actuator. DeBar provides a method for fabricating MEM devices. The invention is thought to be advantageous when producing drop-on-demand liquid emission devices which employ an electrostatic actuator for driving liquid from the device. The most familiar of such devices are used as printheads in ink jet printing systems. Many other applications are

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emerging which make use of devices similar to ink jet printheads, but which emit liquids (other than inks) that need to be finely metered and deposited with high spatial precision.

It would have been obvious to one of ordinary skill in the art at the time of the invention to recognize the device of Hawkins et al. may be modified to employ an electrostatic actuator in order to precisely emit liquids therefrom.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hubbard; Allyn et al.; Johnson; James E. et al.; Sheridan; Richard et al.; Galambos; Paul C. et al.; Gooray; Arthur M. et al.; Silverbrook; Kia; Silverbrook; Kia; Broden, David A.; Chen, Chien-Hua et al.; and Anderson, Kent D. et al. disclose ejection devices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian R. Gordon whose telephone number is 571-272-1258. The examiner can normally be reached on M-F, with 2nd and 4th F off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "B. P. M.", with a long horizontal flourish extending to the right.

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